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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/725,002	12/02/2003	Ning Chen	246099US90	3169

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EXAMINER	
DAO, MINH D	

ART UNIT	PAPER NUMBER
2618	

DATE MAILED: 11/30/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/725,002	CHEN ET AL.	
	Examiner	Art Unit	
	MINH D. DAO	2618	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-13* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12* is/are rejected.

7)☒ Claim(s) *13* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Admitted Prior Art (APA), presented in the Specifications of the application, in view of Tokuchi (JP 411330759 A).

Regarding claim 1, the APA teaches a high sensitivity receiver comprising reception bandpass filter means for receiving a radio frequency signal as an input and for passing a signal in a desired frequency band; a low noise reception amplifier for providing low noise amplification of an output signal from the reception bandpass filter means to a desired level; a laser diode for converting an output signal from the low noise reception amplifier to an optical signal to be delivered; a heat shielding box for confining the reception bandpass filter means, the low noise reception amplifier and the laser diode therein (see fig. 1 and its citations in the specifications pages 1-6). However, the APA does not mention a cooling means for cooling the interior of the heat shielding box. Tokuchi, in an analogous art, teaches a cooling device for cooling an inside of a

retention body which includes a filter and an amplifier (see Abstract, Solution and fig. 1 of Tokuchi). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to provide the above teaching of Tokuchi to the APA in order for the combined system to quickly control the generated heat in side an enclosure that encloses electronic components at a given temperature.

Regarding claim 2, the combination of APA and Tokuchi teaches a high sensitivity receiver according to claim 1, in which the reception bandpass filter means, the low noise reception amplifier and the laser diode are divided into s groups and the cooling means includes s cooling units each cooling one of the groups where s is one of l, 2 or 3 (see figs. 1 and 2 of APA).

Regarding claim 3, the combination of APA and Tokuchi teaches a high sensitivity receiver according to Claim 1, further comprising an array antenna formed by n antenna elements where n is an integer equal to or greater than 2; and a phase shifter synthesizer for receiving received signals from the n antenna elements, adjusting phase differences between the received signals and synthesizing them to deliver a synthesized output as said radio frequency signal (see fig. 2 of APA).

Regarding claim 4, the combination of APA and Tokuchi teaches a high sensitivity receiver according to Claim 3 in which the phase shiftter synthesizer is disposed within the heat shielding box to be cooled (see fig. 2 of APA).

Regarding claim 5, the combination of APA and Tokuchi teaches a high sensitivity receiver according to Claim 1, further comprising an array antenna formed by n antenna elements where n is an integer equal to and greater than 2; and a phase shifter for receiving received signals from the n antenna elements as inputs and for adjusting phase differences between the received signals to deliver n signals; said radio frequency signal being n output signals from the phase shifter, which are input to the reception bandpass filter means which comprises n filters for passing signals in desired frequency bands; said low noise reception amplifier including n amplifiers, into which the n filter output signals are input respectively; and a synthesizer for synthesizing output signals from the n amplifiers to provide an input to the laser diode; the phase shifter and the synthesizer being disposed within the heat shielding box to be cooled (see fig. 2 of APA).

Regarding claim 6, the combination of APA and Tokuchi teaches a high sensitivity receiver according to Claim 5 in which the reception phase shifter, the reception bandpass filter means, the low noise reception amplifier, the synthesizer and the laser diode are divided into s groups and the cooling means includes s cooling units each cooling one of the groups where s is one of 1, 2, 3, 4 or 5 (see figs. 1 and 2 of APA).

Regarding claim 7, the combination of APA and Tokuchi teaches a high sensitivity receiver according to Claim 1, further comprising an array antenna formed by n antenna elements where n is an integer equal to or greater than 2; said radio frequency signal

being signals received by the n antenna elements, the reception bandpass filter means comprising n filters each receiving a radio frequency signal received by one of n antenna elements for passing a signal in a desired frequency band, the low noise reception amplifier including n amplifiers, to which outputs from the n filters are fed; and a phase shifter synthesizer for receiving output signals from the n amplifiers as inputs and for adjusting phase differences between these output signals and for synthesizing the output signals to be input to the laser diode (see fig. 2 of APA).

Regarding claim 8, the combination of APA and Tokuchi teaches a high sensitivity receiver according to Claim 7 in which the reception bandpass filter means, the low noise reception amplifier, the phase shifter synthesizer and the laser diode are divided into s groups and the cooling means includes s cooling units each cooling one of the groups where s is one of 1, 2, 3 or 4 (see fig. 2 of APA).

Regarding claim 9, the combination of APA and Tokuchi teaches a high sensitivity receiver according to Claim 1 in which the cooling means includes a cooling unit formed by a cooling plate and at least one other cooling unit formed by a cooling plate in combination with a heat resistance member for cooling one or more of the reception bandpass filter means, the low noise amplifier and the laser diode to mutually different temperatures (see Abstract, Solution and fig. 1 of Tokuchi).

Regarding claim 10, the combination of APA and Tokuchi teaches a high sensitivity receiver according to claim 1 in which said cooling means includes a plurality of cooling means, each of which cools one or two of the reception bandpass filter means, the low noise reception amplifier and the laser diode to mutually different temperatures (see fig. 2 of APA; also see Abstract, Solution and fig. 1 of Tokuchi).

Regarding claim 11, the combination of APA and Tokuchi teaches a high sensitivity receiver according to Claim 1 in which said cooling means includes a plurality of cooling unit formed by a cooling member, each of which cools one or more of the reception bandpass filter means, the low noise reception amplifier and the laser diode to mutually different temperatures (see fig. 2 of APA; also see Abstract, Solution and fig. 1 of Tokuchi).

Regarding claim 12, the combination of APA and Tokuchi teaches a high sensitivity receiver according to Claim 1, further comprising a power distributor connected between the low noise reception amplifier and the laser diode for branching part of the signal which is input to the laser diode; and a bias current control means for controlling a bias current supplied to the laser diode in accordance with the power level of the signal which is branched by the power distributor (see Abstract, Solution and fig. 1 of Tokuchi).

Allowable Subject Matter

3. Claim 13 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Regarding claim 13, the combination of APA and Tokuchi, as mentioned above, teaches the limitations of claim 1, but does not discloses a pilot signal generator preceding the laser diode for generating a pilot signal which is to be added to said radio frequency signal; an optical/electrical transducer for transducing the optical signal into an electric signal; a branching filter for selecting the pilot signal from an electrical output signal from the optical/electrical transducer; a level detector for detecting the level of the pilot signal which is filtered by the branching filter; and a monitor for comparing the level of the detected pilot signal against a preset threshold to detect the occurrence of a fault in at least the laser diode as specified in the claim.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MINH D. DAO whose telephone number is 571-272-7851. The examiner can normally be reached on 8:30 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, MATTHEW ANDERSON can be reached on 571-272-4177. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Minh Dao MD
AU 2618
November 20, 2006

Matthew Anderson
Superviser AU 2618